## ABSTRACT

A metal mixture is prepared, in which an excess amount of Te is added to a $(Bi\text{-}Sb)_2Te_3$ based composition. After melting the metal mixture, the molten metal is solidified on a surface of a cooling roll of which the circumferential velocity is no higher than 5 m/sec, so as to have a thickness of no less than 30 μm. Thus, a plate shaped raw thermoelectric semiconductor materials 10 are manufactured, in which Te rich phases are microscopically dispersed in complex compound semiconductor phases, and extending directions of C face of most of crystal grains are uniformly oriented. The raw thermoelectric semiconductor materials 10 are layered in the direction of the plate thickness. And the layered body is solidified and formed to form a compact 12. After that, the compact 12 is plastically deformed in such a manner that a shear force is applied in a uniaxial direction that is approximately parallel to the main layering direction of the raw thermoelectric semiconductor materials 10. As a result, a thermoelectric semiconductor 17 having crystal orientation in which extending direction of C face and the direction of c-axis of the hexagonal structure are approximately aligned. As a result, the crystalline orientation is improved, and the thermoelectric Figure-of-Merit is increased.